IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	: Ramarge et al.	Art Unit	: 3729
Serial No.	: 10/762,290	Examiner	: Thiem D. Phan
Filed	: January 23, 2004	Conf. No.	: 4684
Title	: MANUFACTURING PROCESS FOR SURGE ARRESTER MODULE USING PRE-IMPREGNATED COMPOSITE		

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P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF

This Appeal Brief is submitted pursuant to the Notice of Appeal filed in the U.S. Patent and Trademark Office on December 3, 2007, and in support of the appeal from the Final Rejection set forth in the Office Action mailed on August 1, 2007.

(1) Real Party in Interest

The real party in interest is Cooper Industries, LLC by virtue of an assignment from the inventors to McGraw-Edison Company, which is the assignee of record, a merger between McGraw-Edison Company and Cooper Industries, Inc., and a merger between Cooper Industries, Inc. and Cooper Industries, LLC.

(2) Related Appeals and Interferences

There are no related appeals or interferences.

(3) Status of Claims

Claims 8-22 and 33-39 are pending, with claim 8 being independent. Claims 8-16, 18-22, and 33-39 have been rejected and claim 17 has been objected to. Appellant is appealing the rejection of claims 8-16, 18-22, and 33-39.

(4) Status of Amendments

The claims have not been amended subsequent to the final rejection of August 1, 2007.

(5) Summary of Claimed Subject Matter

In the discussion below, reference numerals and references to particular portions of the specification are inserted for illustrative purposes only and are not meant to limit the scope of the claims.

Independent claim 8 is directed to a method for manufacturing an electrical module assembly (step 500, Fig. 25). The method includes providing an electrical module assembly (steps 505, 510, 515, Fig. 25) including at least one MOV disk (600, Fig. 26) to which a reinforcing structure (610, Fig. 28) has been applied (steps 520, 525, Fig. 25), and wrapping the electrical module assembly with shrink film (620, Fig. 29) (steps 530, 535, Fig. 25). The method also includes compacting the wrapped electrical module assembly by heating the shrink film (step 545, Fig. 25) such that the shrink film shrinks and applies a compressive force to the electrical module assembly, and curing the reinforcing structure of the wrapped electrical module assembly at a temperature at which the shrink film no longer applies a compressive force (step 550, Fig. 25).

(6) Grounds of Rejection to be Reviewed on Appeal

Claims 8, 9, 12, 14-16, 33, 36, 37, and 39 have been rejected as being unpatentable over U.S. Patent No. 5,218,508 (Doone); claims 10 and 11 have been rejected as being unpatentable over Doone in view of U.S. Patent No. 5,842,096 (Mabbott); claims 13, 18-22, 34, and 35 have been rejected as being unpatentable over Doone in view of U.S. Patent No. 6,008,975 (Kester); and claim 38 has been rejected as being unpatentable over Doone in view of U.S. Patent No. 4,298,900 (Avdeenko).

(7) Argument

Appellant requests reversal of the rejection of claims 8, 9, 12, 14-16, 33, 36, 37, and 39 because Doone does not describe or suggest curing a reinforcing structure of an electrical module assembly at a temperature at which a shrink film wrapped around the electrical module assembly no longer applies a compressive force to the electrical module assembly, as recited in independent claim 8, and because it would not have been obvious to modify Doone to provide for such curing.

In the only mention of a heat-shrink tape, Doone explains that an arrester core wrapped in a pre-preg material having a resin impregnated textile fabric can be helically wrapped in a heat-shrink tape, the resin of the pre-preg material can be heat-cured, and then the tape can be removed. See Doone at col. 6, lines 34-52. However, Doone never describes or suggests in this passage that the pre-preg material is cured at a temperature at which the heat-shrink tape no longer applies a compressive force to the arrester core. Doone merely explains that the resin of the pre-preg material is heat-cured and then the tape is removed. See Doone at col. 6, lines 48-52.

Nevertheless, the Examiner maintains that this passage of Doone somehow suggests that Doone's pre-preg material is cured in this manner. This passage of Doone explains that the curing of the resin "may be effected by the equivalent technique of helically wrapping the arrester core with its pre-preg wrapping in a heat-shrink tape (e.g., a Mylar tape), then heat-curing the resin and finally removing the tape." Thus, Doone explains that the tape is removed after the pre-preg material is cured. There is nothing in the passage that would suggest that the pre-preg material would be cured at a temperature at which the tape no longer applies a compressive force.

The Examiner also points to col. 6, lines 65-68 of Doone to somehow suggest that Doone's pre-preg material is cured in the claimed manner. This passage of Doone explains that after the arrester core is formed with the reinforced plastic shell (with the pre-preg material) using the heat-shrink tape (as described at col. 6, lines 48-52), the arrester core is then inserted into a heat-shrink sleeve 6. However, Doone's heat-shrink sleeve 6 that is placed around the reinforced plastic shell of the arrester core is not the heat-shrink tape that is used to form the reinforced plastic shell. Rather, Doone's heat-shrink sleeve 6 is placed around the reinforced plastic shell only after the reinforced plastic shell is formed around the arrester core using the process detailed at col. 6, lines 34-52, which includes curing of the pre-preg material. There is no suggestion in Doone that the reinforced plastic shell around the arrester core is cured while the heat-shrink sleeve 6 is around the reinforced plastic shell.

Moreover, it would not have been obvious to modify Doone to cure the pre-preg material at a temperature at which the heat-shrink tape no longer applies a compressive force to the arrester core. The Examiner argues that the heat-shrink tape is "well known to stop shrinking

further at certain temperature and no longer applies a compressive force." While appellant does not concede that this is well known, appellant points out that it is not well known to cure a reinforcing structure <u>such as the pre-preg material of Doone</u> at a temperature at which the heat-shrink tape no longer applies a compressive force. Indeed, the Examiner has provided no example of curing at a temperature at which the heat-shrink tape no longer applies a compressive force and appears to have gleaned this information from applicant's own disclosure, which explains at page 19, lines 25-29 that there is a range of temperatures below the melting temperature of the shrink film within which the shrink film applies a compressive force and above a threshold temperature, the shrink film ceases to apply a compressive force.

Moreover, as explained at page 20, lines 18-28 of applicant's specification, many benefits arise by curing the reinforcing structure at a temperature at which the shrink film no longer applies a compressive force, and none of the benefits appears to be provided by Doone's method or appears to be benefits that Doone would seek. For example, curing at this temperature prevents resin within the reinforcing structure from being improperly driven into interfaces between elements of the electrical module assembly, which eliminates a need to bond the elements of the electrical module assembly together and avoids the need of a non-conductive epoxy between electrically conductive components of the assembly. By contrast, for example, Doone's method does not appear to provide such a benefit since Doone explains that the facing blocks of the arrester core are adhered by use of adhesive. <u>See</u> Doone at col. 5, lines 40-49. Thus, Doone would not be motivated to cure the pre-preg material at a temperature at which heat-shrink tape no longer applies a compressive force to the arrester core because the pre-preg material would not be driven into the interfaces between the varistor blocks due to the use of the adhesive between Doone's varistor blocks.

For at least these reasons, claim 8 is allowable over Doone.

Additionally, as previously discussed, dependent claims 9, 12, 14-16, 33, 36, 37, and 39 are allowable for containing allowable subject matter in their own right. For example, claim 9 recites that the shrink film is a "bi-axially oriented polypropylene film." The Examiner argues that "Mylar and polypropylene film are well known to be polymeric resin and can be interchangeable as heat shrink film as applicants do not provide an advantage or a particular purpose for using the polypropylene as shrink film." First, applicant notes that claim 9 requires

that the shrink film be a "bi-axially oriented polypropylene film," and Doone only mentions the use of Mylar™ as a heat shrink tape at col. 6, lines 50-52. If Mylar™ is not a bi-axially oriented polypropylene film then Doone fails to meet the claimed limitation of a shrink film being a bi-axially oriented polypropylene film. Indeed, Mylar is a polyester film. Accordingly, the Examiner has failed to make a prima facie case of obviousness, which requires that each limitation be found in the cited references.

As another example, claim 12 recites that the temperature at which the wrapped electrical module assembly is compacted is of a different magnitude than the temperature at which the wrapped electrical module assembly is cured. However, Doone never describes that the array is cured at a temperature that is different from the temperature at which the pre-preg material is heated to compact the array. Rather, Doone describes only that the resin is cured with heat and then the heat-shrink tape is removed. See Doone at col. 6, lines 48-52. The Examiner seems to suggest that the mere removal of the heat-shrink tape is somehow equivalent to curing of a reinforcing structure at a temperature at which a shrink film no longer applies a compressive force. While the removal of the heat-shrink tape would prohibit the heat-shrink tape from applying further compressive force to the array, there is nothing in this passage that would suggest that the lack of compressive force was due to curing of the pre-preg material at a temperature at which the heat-shrink tape no longer applies such a compressive force.

Appellant requests reversal of the rejection of claims 10 and 11 because Mabbott does not remedy the failure of Doone to describe or suggest curing a reinforcing structure of an electrical module assembly at a temperature at which a shrink film wrapped around the electrical module assembly no longer applies a compressive force to the electrical module assembly, as recited in independent claim 8, from which claims 10 and 11 depend.

Mabbott relates to an image printing system for printing images onto a surface. See Mabbott at col. 1, lines 6-13. Mabbott does not relate to electrical module assemblies and therefore does not describe or suggest heating a shrink film such that the shrink film shrinks and applies a compressive force to an electrical module assembly, and then curing reinforcing structure of the electrical module assembly at a temperature at which the shrink film no longer applies a compressive force, as recited in claim 8. Accordingly, claim 8 is allowable over any proper combination of Doone and Mabbott, as are dependent claims 10 and 11.

Appellant requests reversal of the rejection of claims 13, 18-22, 34, and 35 because Kester does not remedy the failure of Doone to describe or suggest curing a reinforcing structure of an electrical module assembly at a temperature at which a shrink film wrapped around the electrical module assembly no longer applies a compressive force to the electrical module assembly, as recited in independent claim 8, from which claims 13, 18-22, 34, and 35 depend.

Kester relates to a modular subassembly 10 of an electrical component that includes an array 20 of stacked electrical components retained within an insulative coating 16. See Kester at col. 4, lines 10-34 and Fig. 1. The insulative coating 16 includes a matrix 21 of resinous layers and a spiral wrapped fibrous tape segment 28 that is embedded within the matrix 21. See Kester at col. 5, lines 38-48 and Fig. 4. However, Kester's tape segment 28 is not a shrink film. Accordingly, claim 8 is allowable over any proper combination of Doone and Kester, as are dependent claims 13, 18-22, 34, and 35.

Appellant requests reversal of the rejection of claim 38 because Avdeenko does not remedy the failure of Doone to describe or suggest curing a reinforcing structure of an electrical module assembly at a temperature at which a shrink film wrapped around the electrical module assembly no longer applies a compressive force to the electrical module assembly, as recited in independent claim 8, from which claim 38 depends.

Avdeenko relates to an overvoltage protection device that includes an insulating housing 48 around a column of resistors 43. See Avdeenko at abstract; col. 6, lines 51-62; and Fig. 3. Avdeenko never describes or suggests that a reinforcing structure is applied to the column of resistors or that the column is compacted by heating the insulating housing 48 and that a reinforcing structure is cured. Accordingly, claim 8 is allowable over any proper combination of Doone and Avdeenko, as is dependent claim 38.

In conclusion, appellant submits that all claims are in condition for allowance. The brief fee of $510 is enclosed. Please apply any other charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

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/Diana DiBerardino/
Diana DiBerardino
Reg. No. 45,653

Fish & Richardson P.C.
1425 K Street, N.W.
11th Floor
Washington, DC 20005-3500
Telephone: (202) 783-5070
Facsimile: (202) 783-2331

40476776.doc

Appendix of Claims

1-7. (Canceled)

8. (Original) A method for manufacturing an electrical module assembly, the method comprising:

providing an electrical module assembly including at least one MOV disk to which a reinforcing structure has been applied;

wrapping the electrical module assembly with shrink film;

compacting the wrapped electrical module assembly by heating the shrink film such that the shrink film shrinks and applies a compressive force to the electrical module assembly; and

curing reinforcing structure of the wrapped electrical module assembly at a temperature at which the shrink film no longer applies a compressive force.

9. (Original) The method of claim 8 wherein the shrink film is a bi-axially oriented polypropylene film.

10. (Original) The method of claim 8 wherein compacting the wrapped electrical module assembly by heating the shrink film comprises heating the shrink film at approximately 150 degrees Celsius for approximately 10 minutes to approximately 30 minutes.

11. (Original) The method of claim 8 wherein curing the wrapped electrical module assembly comprises heating the wrapped electrical module assembly at approximately 165 degrees Celsius for approximately 5 minutes to approximately 30 minutes.

12. (Original) The method of claim 8 wherein a temperature at which the wrapped electrical module assembly is compacted is of a different magnitude than the temperature at which the wrapped electrical module assembly is cured.

13. (Original) The method of claim 8 wherein wrapping the electrical module assembly with shrink film comprises:

attaching the shrink film to an end of the electrical module assembly;

spiral winding the shrink film over the surface of the electrical module assembly while maintaining a substantially constant tension on the shrink film; and

securing the shrink film at an opposite end of the electrical module assembly.

14. (Original) The method of claim 8 wherein curing the wrapped electrical module assembly at a temperature at which the shrink film no longer applies a compressive force comprises heating the electrical module assembly at a temperature at which the shrink film relaxes and ceases to apply a compressive force to the electrical module assembly.

15. (Original) The method of claim 14 further comprising cooling the electrical module assembly.

16. (Original) The method of claim 15 further comprising removing the shrink film from the electrical module assembly.

17. (Original) The method of claim 8 wherein curing the wrapped electrical module assembly at a temperature at which the shrink film no longer applies a compressive force comprises, after heating the shrink film:

cooling the electrical module assembly;

removing the shrink film from the electrical module assembly; and

curing the electrical module assembly without the shrink film.

18. (Original) The method of claim 8 wherein providing the electrical module assembly comprises:

placing at least one MOV disk within the electrical module assembly;

compressing the electrical module assembly;

preparing the electrical module assembly; and

wrapping the MOV disks with a reinforcing structure.

19. (Original) The method of claim 18 wherein compressing the electrical module assembly comprises compressing the electrical module assembly using pressure of 250 pounds or more.

20. (Original) The method of claim 18 wherein preparing the electrical module assembly comprises heating the electrical module assembly to a surface temperature of approximately 49 degrees Celsius.

21. (Original) The method of claim 18 wherein the reinforcing structure is a pre-impregnated fiber composite.

22. (Previously presented) The method of claim 18 further comprising maintaining the compression of the electrical module assembly through curing of the reinforcing structure.

23-32. (Canceled)

33. (Previously presented) The method of claim 8 wherein wrapping the electrical module assembly with shrink film comprises attaching shrink film to the electrical module assembly.

34. (Previously presented) The method of claim 8 wherein wrapping the electrical module assembly with shrink film comprises spiral winding the shrink film around the electrical module assembly.

35. (Previously presented) The method of claim 34 wherein spiral winding the shrink film around the electrical module assembly comprises spiral winding the film over the surface of the electrical module assembly while maintaining a substantially constant tension on the film.

36. (Previously presented) The method of claim 8 wherein wrapping the electrical module assembly with shrink film includes securing the wrapped shrink film to the electrical module assembly.

37. (Previously presented) The method of claim 8 wherein compacting the wrapped electrical module assembly includes heating the shrink film such that the shrink film shrinks and applies a radially compressive force to the electrical module assembly.

38. (Previously presented) The method of claim 8 wherein providing the electrical module assembly comprises:

placing at least one MOV disk within the electrical module assembly;

axially compressing the electrical module assembly; and

maintaining the axial compression of the electrical module assembly through curing of the reinforcing structure.

39. (Previously presented) The method of claim 8 wherein wrapping the electrical module assembly with shrink film comprises:

attaching the shrink film to an end of the electrical module assembly; and

securing the shrink film at an opposite end of the electrical module assembly.

Evidence Appendix

None

Related Proceedings Appendix

None